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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/989,481	11/20/2001	Raymond Ming Wah Chau	12592-4	9849

7590 08/08/2003

MARGRET A. CHURCHILL  
FULBRIGHT AND JAWORSKI LLP  
865 SOUTH FIGUEROA  
TWENTY-NINTH FLOOR  
LOS ANGELES, CA 90017-2571

EXAMINER
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NICHOLS, CHRISTOPHER J

ART UNIT	PAPER NUMBER
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1647

DATE MAILED: 08/08/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/989,481

Applicant(s)

CHAU, RAYMOND MING WAH

Examiner

Christopher Nichols, Ph.D.

Art Unit

1647

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 28 May 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) 8, 11 and 17-34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 10 and 12-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 November 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3. 6) ☐ Other:

**DETAILED ACTION*****Election/Restrictions***

1. Applicant's election with traverse of Invention I (claims 1-7, 9-10, and 12-16) drawn to a method for promoting survival, growth, proliferation, or maintenance of mammalian motoneurons comprising administering to the motoneurons an effective amount of SEQ ID NO: 4 in Paper No. 6 (20 May 2003) is acknowledged. The traversal is on the ground(s) that Inventions I, II, and III are not functionally or physically distinct from one another. This is not found persuasive because Invention I is drawn to methods of treating motoneurons while Invention II and Invention III are drawn to method of treating spinal cord injuries. Spinal cord injuries (SCI) are known to be notoriously difficult to treat and to date, no known treatment is effective for spinal cord injury [Jackowski (1995) "Neural Injury repair: hope for the future as barriers to effective CNS regeneration become clear." British Journal of Neurosurgery 9: 303-317; Lee & Wolfe (July/August 2002) "Peripheral Nerve Injury and Repair." J. Am. Acad. Orthop. Surg. 8(4): 243-252]. Therefore, the search and consideration of motoneuron injury (Invention I) is independent and distinct from SCI (Invention II and III). Further, Inventions II and III are independent and distinct from one another due to the anatomical and molecular/cellular factors at play in an injured spinal cord versus a severed spinal cord. Each situation requires an independent and distinct search of the literature. Therefore Invention I, II, and III are independent and distinct from one another. The requirement is still deemed proper and is therefore made FINAL.

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2. The Examiner submits the following correction for the previous Office Action (Paper No. 4, 20 February 2003), pp. 5 ¶4 should read: "Currently, claims 15 and 31 are generic."  
"Claim 54" as written is a typo.

### *Drawings*

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "1a, 1b, 1c" appear in Figure 3A and "2c, 3a, 4, 3" appear in Figure 3C. Applicant should delete these reference characters from the figures. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: Figures 4 and 9 have four panels (1-4) which are described in the instant Specification but are not listed in the Figure. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: Figures 8A and 10B contain "(a)" and Figure 11A contains "b" superscript in the Figure but this is not explained in the instant Specification. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office

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action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. Claims 1-7, 9, 13, and 16 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for *a method for promoting survival or maintenance of mammalian motoneurons or promoting axonal regeneration or reinnervation of target muscle of motoneurons comprising administering to the motoneurons an effective amount of SEQ ID NO: 4, does not reasonably provide enablement for said method using mutations, sequence variants, or derivatives of SEQ ID NO: 4, or the rescue and morphologically-complete neuronal regeneration of axotomized motoneurons in vivo or growth and/or proliferation of motoneurons in vivo.* The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims.

7. The claims are drawn very broadly to methods of using SEQ ID NO: 4 as a therapeutic polypeptide to promote growth, proliferation, and regeneration of motoneurons in the nervous system. The above invention is drawn to methods promoting survival, growth, proliferation, maintenance, and regeneration in mammals suffering peripheral nerve damage from a variety of disorders. The language of said claims encompasses all motoneurons (also known as

“motoneurons”). The specification teaches that in a rat model of sciatic nerve injury, SEQ ID NO: 4 promotes survival and maintenance of motoneurons. The salubrious effects of SEQ ID NO: 4 are blocked by anti-MNTF antibodies.

8. Since the specification fails to provide any guidance for the successful use of variants and derivatives of SEQ ID NO: 4 and since the resolution of the various complications in regards to motoneuron survival is highly unpredictable, one of skill in the art would have been unable to practice the invention without engaging in undue trial and error experimentation. Further, the instant Specification does not provide any evidence for growth, proliferation, or regeneration (as in the reviving of dead cells). In order to practice the invention using the specification and the state of the prior art as outlined below, the quantity of experimentation required to practice the invention as claimed *in vivo* would require the *de novo* determination of formulations with variants and derivatives of SEQ ID NO: 4 with increased motoneuron survival. In the absence of any guidance from the specification, the amount of experimentation would be undue, and one would have been unable to practice the invention over the scope claimed.

9. The specification as filed does not provide any guidance or examples that would enable a skilled artisan to use the disclosed methods of using variants and derivatives of SEQ ID NO: 4 in a patient or to cause the regeneration of central nervous system neurons. Additionally, a person skilled in the art would recognize that predicting the efficacy of using a various SEQ ID NO: 4 derived polypeptide based solely on the performance of SEQ ID NO: 4 as highly problematic. Thus, although the specification prophetically considers and discloses general methodologies of using the claimed methods in therapies, such a disclosure would not be considered enabling since

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the state of nervous system trauma and injury is highly unpredictable. The factors listed below have been considered in the analysis of enablement:

- (A) The breadth of the claims;
- (B) The nature of the invention;
- (C) The state of the prior art;
- (D) The level of one of ordinary skill;
- (E) The level of predictability in the art;
- (F) The amount of direction provided by the inventor;
- (G) The existence of working examples; and
- (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

10. The following references are cited herein to illustrate the state of the art of motoneuron and sciatic nerve injury.

11. On the breadth of the claims, Carlstedt (December 2000) "Approaches permitting and enhancing motoneuron regeneration after spinal cord, ventral foot, plexus and peripheral nerve injuries." Current Opinion in Neurology 13(6): 683-686 teaches that axon regeneration is possible in the peripheral nervous system (PNS) but not the central nervous system (CNS). While motoneurons reinnervate their target muscles, it is often non-specific (pp. 683). In addition, poor prognosis of injury as well as incomplete and unpredictable recovery in the direction of reinnervation presents additional obstacles (pp. 685). Thus the skilled artisan is confronted with an undue burden of experimentation to practice the invention to the full scope of the claims.

12. On the state of the prior art, Yu *et al.* (1 July 1994) "Muscle-Derived Motoneuronotropic Factors Promote Survival of Axotomized Motoneurons of the Facial Nerve." Society for Neuroscience Abstracts 18(Part 2): 1296 (Abstract #546.15) teach that MNTF1 promotes survival of axotomized motoneurons. The Specification teaches that SEQ ID NO: 4 is an



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isoform of MNTF1, specifically MNTF1-F6 (pp. 8 line 2). Thus the claims have support in the prior art that MNTF1 can promote survival but Yu *et al.* does not support the activity of MNTF1 to promote regeneration and growth.

13. On the level of predictability in the art, Evans (1 August 2001) "Peripheral Nerve Injury: A Review and Approach to Tissue Engineered Constructs." The Anatomical Record 263(4): 396-404 teaches that while peripheral injury can be treated but full functional recovery is seldom achieved (pp. 396). It is noted by Evans that growth factors, such as SEQ ID NO: 4 as claimed, may aid in the recovery (pp. 401-402). Thus the skilled artisan is confronted with an undue experimentation burden to use SEQ ID NO: 4 and all the variants to achieve full functional recovery.

14. Regarding derivatives and fragments of **SEQ ID NO: 4**, the problem of predicting protein structure from sequence data and in turn utilizing predicted structural determinations to ascertain functional aspects of the protein is extremely complex. While it is known that many amino acid substitutions are generally possible in any given protein the positions within the protein's sequence where such amino acid substitutions can be made with a reasonable expectation of success are limited. Certain positions in the sequence are critical to the protein's structure/function relationship, e.g. such as various sites or regions directly involved in binding, activity and in providing the correct three-dimensional spatial orientation of binding and active sites. These or other regions may also be critical determinants of antigenicity. These regions can tolerate only relatively conservative substitutions or no substitutions [see Wells (18 September 1990) "Additivity of Mutational Effects in Proteins." Biochemistry 29(37): 8509-8517; Ngo *et al.* (2 March 1995) "The Protein Folding Problem and Tertiary Structure Prediction, Chapter 14:

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Computational Complexity Protein Structure Prediction, and the Levinthal Paradox” pp. 492-495]. However, Applicant has provided little or no guidance beyond the mere presentation of sequence data to enable one of ordinary skill in the art to determine, without undue experimentation, the positions in the protein which are tolerant to change (e.g. such as by amino acid substitutions or deletions), and the nature and extent of changes that can be made in these positions. Although the specification outlines art-recognized procedures for producing and screening for active muteins, this is not adequate guidance as to the nature of active derivatives that may be constructed, but is merely an invitation to the artisan to use the current invention as a starting point for further experimentation. Even if an active or binding site were identified in the specification, they may not be sufficient, as the ordinary artisan would immediately recognize that an active or binding site must assume the proper three-dimensional configuration to be active, which conformation is dependent upon surrounding residues; therefore substitution of non-essential residues can often destroy activity. The art recognizes that function cannot be predicted from structure alone [Bork (2000) “Powers and Pitfalls in Sequence Analysis: The 70% Hurdle.” Genome Research 10:398-400; Skolnick and Fetrow (2000) “From gene to protein structure and function: novel applications of computational approaches in the genomic era.” Trends in Biotech. 18(1): 34-39, especially p. 36 at Box 2; Doerks *et al.*, (June 1998) “Protein annotation: detective work for function prediction.” Trends in Genetics 14(6): 248-250; Smith and Zhang (November 1997) “The challenges of genome sequence annotation or ‘The devil is in the details’.” Nature Biotechnology 15:1222-1223; Brenner (April 1999) “Errors in genome annotation.” Trends in Genetics 15(4): 132-133; Bork and Bairoch (October 1996) “Go hunting in sequence databases but watch out for the traps.” Trends in Genetics 12(10): 425-427]. Due to

the large quantity of experimentation necessary to generate the infinite number of derivatives recited in the claims and possibly screen same for activity, the lack of direction/guidance presented in the specification regarding which structural features are required in order to provide activity, the absence of working examples directed to same, the complex nature of the invention, the state of the prior art which establishes the unpredictability of the effects of mutation on protein structure and function, and the breadth of the claims which fail to recite any structural or functional limitations, undue experimentation would be required of the skilled artisan to make and/or use the claimed invention in its full scope.

15. Thus the specification of the instant application fails to provide adequate guidance for one of skill in the art to overcome the unpredictability and challenges of applying results from experiments with a single isoform of SEQ ID NO: 4 to the use of variants and derivatives in the instantly claimed therapy as exemplified in the references above.

16. Claims 1-4 and 16 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

17. The claims are drawn to polypeptides having at least 80, 85, 90, or 95% sequence identity with a particular disclosed sequence or conservative mutations. The claims do not require that the polypeptide possess any particular conserved structure, or other distinguishing feature, such as a specific biological activity. Thus, the claims are drawn to a genus of polypeptides that is defined by sequence identity.

18. To provide adequate written description and evidence of possession of a claimed genus, the specification must provide sufficient distinguishing identifying characteristics of the genus. The factors to be considered include disclosure of complete or partial structure, physical and/or chemical properties, functional characteristics, structure/function correlation, methods of making the claimed product, and any combination thereof. In this case, the only factor present in the claim that is sufficiently disclosed is a partial structure in the form of a recitation of percent identity. The specification does not identify any particular portion of the structure that must be conserved, nor does it provide a disclosure of structure/function correlation. The distinguishing characteristics of the claimed genus are not described. The only adequately described species is a polypeptide comprising SEQ ID NO: 4. No active variants are disclosed. Accordingly, the specification does not provide adequate written description of the claimed genus.

19. *Vas-Cath Inc. v. Mahurkar*, 19USPQ2d 1111, clearly states “applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of *the invention*. The invention is, for purposes of the ‘written description’ inquiry, *whatever is now claimed*.” (See page 1117.) The specification does not “clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed.” (See *Vas-Cath* at page 1116). As discussed above, the skilled artisan cannot envision the detailed chemical structure of the encompassed genus of polypeptides, and therefore conception is not achieved until reduction to practice has occurred, regardless of the complexity or simplicity of the method of isolation. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method of isolating it. The compound itself is required.

See *Fiers v. Revel*, 25 USPQ2d 1601 at 1606 (CAFC 1993) and *Amgen Inc. v. Chugai Pharmaceutical Co. Ltd.*, 18 USPQ2d 1016.

20. One cannot describe what one has not conceived. See *Fiddes v. Baird*, 30 USPQ2d 1481 at 1483. In *Fiddes*, claims directed to mammalian FGF's were found to be unpatentable due to lack of written description for that broad class. The specification provided only the bovine sequence.

21. Therefore, only isolated polypeptides comprising the amino acid sequence set forth in SEQ ID NO: 4, but not the full breadth of the claim meets the written description provision of 35 U.S.C. §112, first paragraph. Applicant is reminded that *Vas-Cath* makes clear that the written description provision of 35 U.S.C. §112 is severable from its enablement provision.

22. Claims 10, 12, 14, and 15 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

23. The claims are drawn very broadly to methods of using SEQ ID NO: 4 as a therapeutic polypeptide to promote regeneration of motoneurons in the nervous system in mammals suffering peripheral nerve damage from a variety of disorders. The language of said claims encompasses all motoneurons (also known as "motoneurons"), as well as inhibiting the effects of hereditary motoneuron disease in a mammal. The specification teaches that in a rat model of sciatic nerve injury, SEQ ID NO: 4 promotes survival and maintenance of motoneurons. The salubrious effects of SEQ ID NO: 4 are blocked by anti-MNMF2 antibodies.

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24. Since the specification fails to provide any guidance for the successful use of SEQ ID NO: 4 to inhibit a hereditary disease and since the resolution of the various complications in regards to motoneuron survival in the full range of diseases and disorders claimed (claim 15) is highly unpredictable, one of skill in the art would have been unable to practice the invention without engaging in undue trial and error experimentation. In order to practice the invention using the specification and the state of the prior art as outlined below, the quantity of experimentation required to practice the invention as claimed *in vivo* would require the *de novo* determination of formulations of SEQ ID NO: 4 with the relief of symptoms in a host of diseases, injuries, and disorders. While the Specification clearly demonstrates a salubrious effect of SEQ ID NO: 4 in peripheral nerve injury, the skilled artisan is required to test and evaluation the effect of SEQ ID NO: 4 in all the other diseases and disorders claimed. In the absence of any guidance from the specification, the amount of experimentation would be undue, and one would have been unable to practice the invention over the scope claimed.

25. The specification as filed does not provide any guidance or examples that would enable a skilled artisan to use the disclosed methods of SEQ ID NO: 4 in a patient or to cause the regeneration of central nervous system neurons. Additionally, a person skilled in the art would recognize that predicting the efficacy of using SEQ ID NO: 4 based solely on the performance of SEQ ID NO: 4 in a model of peripheral nerve damage in all the diseases and diseases claimed as highly problematic. Thus, although the specification prophetically considers and discloses general methodologies of using the claimed methods in therapies, such a disclosure would not be considered enabling since the state of nervous system trauma and injury is highly unpredictable. The factors listed below have been considered in the analysis of enablement:

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- (A) The breadth of the claims;
- (B) The nature of the invention;
- (C) The state of the prior art;
- (D) The level of one of ordinary skill;
- (E) The level of predictability in the art;
- (F) The amount of direction provided by the inventor;
- (G) The existence of working examples; and
- (H) The quantity of experimentation needed to make or use the invention based on the content of the disclosure.

26. The following references are cited herein to illustrate the state of the art of motoneuron and sciatic nerve injury.

27. On the breadth of the claims, Carlstedt (December 2000) "Approaches permitting and enhancing motoneuron regeneration after spinal cord, ventral foot, plexus and peripheral nerve injuries." Current Opinion in Neurology 13(6): 683-686 teaches that axon regeneration is

possible in the peripheral nervous system (PNS) but not the central nervous system (CNS).

While motoneurons reinnervate their target muscles, it is often non-specific (pp. 683). In addition, poor prognosis of injury as well as incomplete and unpredictable recovery in the direction of reinnervation presents additional obstacles (pp. 685). Thus the skilled artisan is confronted with an undue burden of experimentation to practice the invention to the full scope of the claims.

28. On the nature of the invention, Liuzzi and Tedeschi (January 1991) "Peripheral Nerve Regeneration." Surgical Management of Peripheral Nerve Injury and Entrapment 2(1): 31-42

teaches that the major problem of peripheral nerve regeneration is the specificity of

reinnervation. The success of nerve regeneration, not the revival of dead cells but the

reinnervation of the target organ by the peripheral nerve, depends on the survival of the

axotomized neurons, the efficacy of axonal outgrowth from those neurons, and the specificity of reinnervation of target organs (pp. 36 and 38).

29. Concerning the predictability of motoneuron axon regeneration, Evans (1 August 2001) "Peripheral Nerve Injury: A Review and Approach to Tissue Engineered Constructs." The Anatomical Record 263(4): 396-404 teaches that peripheral injury can be treated but full functional recovery is seldom achieved (pp. 396). It is noted by Evans that growth factors, such as SEQ ID NO: 4 as claimed, may aid in the recovery (pp. 401-402). Furthermore Kassir-Duchossoy *et al.* (20 July 2001) "Reinervation of a denervated skeletal muscle by spinal axons regenerating through a collagen channel directly implanted into the rat spinal cord." Brain Research 908(1): 25-34 teaches that conduits or physical guides are often necessary for correct or specific reinnervation of the target muscle by damaged motoneurons (pp. 33). Thus the skilled artisan is confronted with an undue experimentation burden to use SEQ ID NO: 4 and all the variants to achieve full functional recovery.
30. Thus the specification of the instant application fails to provide adequate guidance for one of skill in the art to overcome the unpredictability and challenges of applying results from experiments with a single isoform of SEQ ID NO: 4 in the instantly claimed therapy as exemplified in the references above.

### *Summary*

31. Claims 1-7, 9-10, and 12-16 are hereby rejected.
32. The following articles, patents, and published patent applications were found by the Examiner during the prior art search and are here made of note:



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- a. Welch (November 1996) "Peripheral Nerve Injury." Seminars in Veterinary Medicine and Surgery (Small Animal) **11**(4): 273-284
- b. Jacob *et al.* (July 2001) "Mechanisms and molecules in motor neuron specification and axon pathfinding." BioEssays **23**(7): 582-595
- c. Kandel *et al.* (2000) Principles of Neural Science 4<sup>th</sup> Ed. Chapter 33: The Organization of Movement pp. 663-673.
- d. Nolte (1999) The Human Brain: An Introduction to Its Functional Anatomy 4<sup>th</sup> Ed. Chapter 18: Overview of Motor Systems. pp. 434-449

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**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Christopher James Nichols, Ph.D.** whose telephone number is 703-305-3955. The examiner can normally be reached on Monday through Friday, 8:00AM to 5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **Gary Kunz, Ph.D.** can be reached on 703-308-4623. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9306 for regular communications and 703-872-9307 for After Final communications. The fax phone numbers for the customer service center is 703-872-9305

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0196.

CJN  
July 15, 2003

  
**GARY KUNZ**  
**SUPERVISORY PATENT EXAMINER**  
**TECHNOLOGY CENTER 1600**